

## Test facility aids hardware design for ISS

On September 28, Glenn celebrated the grand opening of a new Acoustical Testing Laboratory (ATL) designed and constructed to meet the requirements of the Glenn-developed Fluids and Combustion Facility (FCF). FCF is one of six permanent U.S. research facilities to be housed on the International Space Station (ISS).

Located inside the Bldg. 333 Annex, the ATL will function as a design verification facility, producing data to document requirements compliance, and more importantly, as an in-house lab where noise control design strategies can be actively pursued and integrated into the overall design of flight hardware.

"The chamber was sized to accommodate the dimensions of the specific items we would want to test in here, from small payload noise sources like fans all the way up to six-foot high racks," said ATL Manager Beth Cooper, Engineering and Design Analysis Division (EDAD). "We'll be testing experimental payloads for ISS—science experiments like FCF, SAMS II, SAMS-FF, and CM2, which have to meet noise emission limits so that astronauts don't experience hearing loss or have trouble communicating."

The ATL consists of a 23'x27'x20' (h) convertible hemi-anechoic chamber with 34" absorptive fiberglass wedges covered with high-transparency perforated metal that provide an anechoic environment down to 100 Hz. The spring-isolated floor system affords vibration isolation above 3 Hz. The separate sound-attenuating test support enclosure houses a multichannel PC-based acoustical data acquisition system set up to work with one-operator/one-station.



(Left to right) ATL Manager Beth Cooper, EDAD, is joined by Deputy Director for Operations Julian Earls, Chief of EDAD John Taylor, Microgravity Science Division Chief Jack Salzman, and Construction Management Branch Chief Dallas Lauderdale in cutting the ribbon to the new Acoustical Testing Laboratory.

"Getting numbers is easy, but knowing what they mean and making sure that after a test—especially if it's a one-shot test—you can look at the data and understand what has happened is what separates our ATL from the rest," said David Nelson, an acoustical expert who developed the data acquisition system. "I was privileged to help with specifications, which were built based on National Instruments acquisition boards and a special software package called Sound Power System. ATL's capability for data acquisition surpasses state-of-the-art because it also does careful documentation. We're already looking to extend its capabilities."

The ATL will be operated by the EDAD, adding acoustical testing capability to its suite of vibroacoustic test services currently provided by the Structural

Dynamics Laboratory and the Microgravity Emissions Laboratory. ♦

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